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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)
	10/655,838	EPSTEIN ET AL.
	Examiner	Art Unit
	Natalie Lennox	2626

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *05 September 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-43* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-43* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *05 September 2003* is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *September 05, 2003*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

1. Claims 4 and 20 are objected to because of the following informalities: Claims 4 and 20 cite the limitations "MELM2" and "MELM3" in line 2. These limitations are acronyms that should be placed inside a parenthesis after the correct spelling of the acronym, for example, Maximum Entropy Method 2 (MELM2). Appropriate correction is required.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 12 and 25 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. As per claims 12 and 25, applicant claims the use of a "classifier" to combine the semantic structured language models and speech recognition based features with the extracted probabilities. In applicant's disclosure, "In block 214 probabilities assigned to tags, labels, extensions, etc. obtained from the parser tree may be combined with SSLM and speech recognition based features using a classifier," there exists no further description of the classifier function. One having ordinary skill in the art would recognize that the function of a classifier is determining to what class (set, group,

collection, etc.) an item (subject, thing, object, word, etc.) belongs. The use of a classifier, as applicant discloses, is not clear. There is no description present in the disclosure that would explain how a "classifier" is used to combine semantic structured language models, speech recognition based features, and the extracted probabilites.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 31-33, 35, 38, and 41-43 are rejected under 35 U.S.C. 102(e) as being anticipated by Chelba et al. (US 2003/0216905).

As per claim 31, Chelba et al. teach a system for speech recognition, comprising:

a unified language model including a semantic language model and a lexical language model (418 and 420 from Fig. 11, also Fig. 7B);

a recognition engine which finds a parse tree to analyze a word group using the lexical model and the semantic models, wherein the parse tree is selected based on lexical information and semantic information which considers tags, labels, and extensions to recognize speech (decoder 416 of speech recognition system from Fig. 11, parse trees from Figs. 7A, 7B, and parsing from Figs. 9 and 10).

As per claim 32, Chelba et al. teach the system according to claim 31, wherein the parser tree includes semantic information and classer information used in identifying a best parser tree for a given word group (Fig. 7B illustrates labels 224, 226, 234, and 236 which contain semantic and classer (pertaining to a group) information).

As per claim 33, Chelba et al. teach the system according to claim 31, wherein the parser tree includes information extracted from parsed sentences to statistically model semantic and lexical content of sentences (Fig. 7B).

As per claim 35, Chelba et al. teach the system according to claim 31, wherein the semantic language model includes one or more of relative labels, token numbers, and answers to questions related to word order or placement (Paragraphs [0044] - [0046], and [0071] - [0072], headwords, non-terminal labels, r, n, k, (head-word, non-terminal label)).

As per claim 38, Chelba et al. teach the system according to claim 31, wherein the semantic model is trained by including history parameters and history questions (Paragraph [0054] show the probabilities from which the model is based with the use of history parameters. Also Fig. 4 demonstrates the use of the history questions in the model).

As per claim 41, Chelba et al. teach the system according to claim 31, further comprising a confidence measurement module (422 from Fig. 11).

As per claim 42, Chelba et al. teach the system according to claim 31, wherein the confidence measurement module employs a statistical method to combine word

sequences with the parse tree to determine a confidence score for recognized speech (Paragraphs [0081], [0083], [0088], and [0089], also Figs. 9, 10, and 11).

As per claim 43, Chelba et al. teach the system according to claim 31, wherein the confidence measurement module extracts probabilities assigned to tag nodes, label nodes, and extensions in the parse tree (Paragraphs [0081], [0083], [0088], and [0089], also Figs. 9, 10, and 11).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claims 1, 3, 5, 8-11, 14, 17-19, 21, 24, 27, and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chelba et al. (US 2003/0216905) in view of Lee et al. (US 2002/0087316).

As per claims 1 and 17, Chelba et al. teach a method and program storage device readable by machine for speech recognition, comprising the steps of:

rescoring the likely hypotheses by using semantic content by employing semantic structured language models (304, Fig. 9); and

scoring parse trees to identify a best sentence according to the sentences' parse tree by employing the semantic structured language models to clarify the recognized speech (320 and 324, Fig. 9), but Chelba does not specifically mention

generating a set of likely hypotheses in recognizing speech.

However, Lee et al. teach generating a set of likely hypotheses in recognizing speech (recognition results and multiple hypotheses from ASR engine 36 from Figs. 1 and 3).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have used the feature of generating a set of likely hypotheses in recognizing speech as taught by Lee et al. for Chelba et al.'s method and program storage device readable by machine because Lee provides a method for speech recognition of a user speech input that contains a request to be processed, wherein a speech recognition engine generates recognized words form the user speech input (see Paragraph [0004]).

As per claims 18 and 30, Chelba et al. teach a method and program storage device readable by machine for speech recognition, comprising the steps of:

rescoring the likely hypotheses by using semantic content by employing semantic structured language models (304, Fig. 9);

scoring parse trees to identify a best sentence according to the sentences' parse tree by employing the semantic structured language models to clarify the recognized speech (320 and 324, Fig. 9); and

determining a confidence measurement by employing scores obtained from the semantic structured language models along with other speech recognition based features (confidence measure module 422 from Fig. 11 and Paragraph [0089]), but Chelba et al. do not specifically mention

generating a set of likely hypotheses in recognizing speech.

However, Lee et al. teach generating a set of likely hypotheses in recognizing speech (recognition results and multiple hypotheses from ASR engine 36 from Figs. 1 and 3).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have used the feature of generating a set of likely hypotheses in recognizing speech as taught by Lee et al. for Chelba et al.'s method and program storage device readable by machine because Lee provides a method for speech recognition of a user speech input that contains a request to be processed, wherein a speech recognition engine generates recognized words form the user speech input (see Paragraph [0004]).

As per claims 3 and 19, Chelba et al. in view of Lee et al. teach the method according to claims 1 and 18, wherein the set of likely hypotheses is in the form of an N-best list or lattice (Lee's Paragraph [0018]).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have used the feature of generating a set of likely hypotheses in recognizing speech as taught by Lee et al. for Chelba et al.'s method and program storage device readable by machine because Lee provides a method for speech recognition of a user speech input that contains a request to be processed, wherein a speech recognition engine generates recognized words form the user speech input (see Paragraph [0004]).

As per claims 5 and 21, Chelba et al. in view of Lee et al. teach the method according to claims 1 and 18, wherein the step of scoring parse trees to identify a best sentence according to the sentence's parse tree by employing the semantic structured

language models to clarify the recognized speech includes the step of training the structured semantic language models in accordance with history parameters and history questions (Paragraph [0054] show the probabilities from which the model is based with the use of history parameters. Also Fig. 4 demonstrates the use of the history questions in the model).

As per claim 8, Chelba et al. in view of Lee et al. teach the method according to claim 1, further comprising the step of determining a confidence measurement (confidence measure module 422 from Fig. 11).

As per claim 9, Chelba et al. in view of Lee et al. teach the method according to claim 8, wherein the step of determining a confidence measurement includes employing a statistical method to combine word sequences with a parser tree to determine a confidence score for recognized speech (Paragraphs [0081], [0083], [0088], and [0089], also Figs. 9, 10, and 11).

As per claim 10, Chelba et al. in view of Lee et al. teach the method according to claim 8, wherein the step of determining a confidence measurement includes employing scores obtained from the semantic structured language models along with other speech recognition based features (Paragraphs [0088] and [0089], and Fig.11).

As per claims 11 and 24, Chelba et al. in view of Lee et al. teach the method according to claims 1 and 18, further comprising the step of extracting probabilities assigned to tags, labels, and extensions obtained from a parser tree (Paragraphs [0045]-[0054]).

As per claims 14 and 27, Chelba et al. in view of Lee et al. teach the method according to claims 1 and 18, wherein the semantic structured language models are trained using one or more of relative labels, token numbers, and answers to question related to word order or placement (Paragraphs [0044] - [0046], and [0071] - [0072], headwords, non-terminal labels, r, n, k, (head-word, non-terminal label)).

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> **(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.**

9. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Chelba et al. (US 2003/0216905) in view of Lee et al. (2002/0087316), as applied to claim 1 above, and further in view of Ryzchachkin et al. (US 2005/0055199).

As per claim 2, Chelba et al. in view of Lee et al. teach the method according to claim 1, but they do not specifically mention the method further comprising the step of training a language model using speech recognition methods. However, Ryzchachkin et al. teach step of training a language model using speech recognition methods (Paragraph [0003]).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have used the feature of training a language model using speech recognition methods as taught by Ryzchachkin et al. for Chelba's method, as modified

by Lee because Ryzchachkin et al. provides statistical language models used in consecutive speech recognition (CSR) systems, and more specifically to the more efficient organization of such models (Paragraph [0001]).

10. Claims 4, 6-7, 13, 15-16, 20, 22-23, 26, and 28-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chelba et al. (US 2003/0216905) in view Lee et al. (2002/0087316) as applied to claims 1, 5, 18, and 21 above, and further in view of Ratnaparkhi (Learning to Parse Natural Language with Maximum Entropy Models, 1999).

As per claims 4 and 20, Chelba et al. in view of Lee et al. teach the method according to claims 1 and 18, but they do not specifically mention wherein the step of rescoring employs MELM2 or MELM3 semantic structured language models. However, Ratnaparkhi teaches the step of rescoring employs MELM2 or MELM3 semantic structured language models (Sections 3.2.6. and 3.2.1., Fig. 9 and Table 3).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have used the feature of rescoring employing MELM2 or MELM3 semantic structured language models as taught by Ratnaparkhi for Chelba's method, as modified by Lee et al., because Ratnaparkhi provides a maximum entropy "framework, [which] is independent of the parsing task and can be used for many other problems, like language modeling for speech recognition." (see 1st paragraph of Section 3.2.1.).

As per claims 6 and 22, Chelba et al. in view of Lee et al. teach the method according to claims 5 and 21, but they do not specifically mention wherein the history

parameters include a previous word (wj-1), a previous word of the previous word (wj-2), a parent constituent label (L), a number of tokens (N) to the left since L starts, a previous closed constituent label (O), a number of tokens (M) to the left after O finishes, and a grandparent label (G). However, Ratnaparkhi teaches history parameters, which include a previous word (wj-1), a previous word of the previous word (wj-2), a parent constituent label (L), a number of tokens (N) to the left since L starts, a previous closed constituent label (O), a number of tokens (M) to the left after O finishes, and a grandparent label (G) (Fig. 9, Sections 3.2 and 3.2.1, and equation (1) from Section 3.2.1., wherein *b* of equation (1) represents "any information that might be useful for predicting *a*," such as number of tokens for labels L or O.)

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have used the feature of history parameters as taught by Ratnaparkhi for Chelba's method, as modified by Lee et al., because Ratnaparkhi provides a maximum entropy "framework, [which] is independent of the parsing task and can be used for many other problems, like language modeling for speech recognition." (see 1st paragraph of Section 3.2.1.). It would have also been obvious to one having ordinary skill in the art at the time the invention was made to have used the feature of history parameters as taught by Ratnaparkhi in order to use arbitrarily diverse information in the context of *b* when computing the probability of an action *a* of some procedure *X* (see 1st paragraph of Section 3.2.).

As per claims 7 and 23, Chelba et al. in view of Lee et al. teach the method according to claims 5 and 21, but they do not specifically mention wherein the history

questions include a default, (wj-1), (wj-1, wj-2), (L, N), (O, M), and (L, G). However, Ratnaparkhi teaches history questions including a default, (wj-1), (wj-1, wj-2), (L, N), (O, M), and (L, G) (Fig. 9, Sections 3.2 and 3.2.1, and equation (1) from Section 3.2.1., wherein *b* of equation (1) represents "any information that might be useful for predicting *a*," such as number of tokens for labels L or O.).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have used the feature of history parameters as taught by Ratnaparkhi for Chelba's method, as modified by Lee et al., because Ratnaparkhi provides a maximum entropy "framework, [which] is independent of the parsing task and can be used for many other problems, like language modeling for speech recognition." (see 1st paragraph of Section 3.2.1.). It would have also been obvious to one having ordinary skill in the art at the time the invention was made to have used the feature of history parameters as taught by Ratnaparkhi in order to use arbitrarily diverse information in the context of *b* when computing the probability of an action *a* of some procedure *X* (see 1st paragraph of Section 3.2.).

As per claims 13 and 26, Chelba et al. in view of Lee et al. teach the method according to claims 1 and 18, but he does not specifically mention wherein the semantic structured language models being trained by employing unigram, bigram, and trigram features. However, Ratnaparkhi teaches the semantic structured language models trained by employing unigram, bigram, and trigram features (Fig. 9 and Table 3).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have used the feature of semantic structured language models

trained by employing unigram, bigram and trigram features as taught by Ratnaparkhi for Chelba's method, as modified by Lee et al., because Ratnaparkhi provides a maximum entropy "framework, [which] is independent of the parsing task and can be used for many other problems, like language modeling for speech recognition." (see 1st paragraph of Section 3.2.1.).

As per claims 15 and 28, Chelba et al. in view of Lee et al. teach the method according to claims 1 and 18, but they do not specifically mention wherein the semantic structured language models are trained by including a unigram feature, a bigram feature, a trigram feature, a current active parent label (Li), a number of tokens (Ni) to the left since current parent label (Li) starts, a previous closed constituent label (Oi), a number of tokens (Mi) to the left after the previous closed constituent label finishes, and a number of questions to classify parser tree entries. However, Ratnaparkhi teaches semantic structured language models trained by including a unigram feature, a bigram feature, a trigram feature, a current active parent label (Li), a number of tokens (Ni) to the left since current parent label (Li) starts, a previous closed constituent label (Oi), a number of tokens (Mi) to the left after the previous closed constituent label finishes; and a number of questions to classify parser tree entries (Fig. 9, Table 3, Sections 3.2, 3.2.1, and 3.2.6., and equation (1) from Section 3.2.1., wherein *b* of equation (1) represents "any information that might be useful for predicting *a*," such as number of tokens for labels L or O.).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have used the feature of semantic structured language models

trained by employing unigram, bigram, trigram, labels, and token features as taught by Ratnaparkhi for Chelba's method, as modified by Lee et al., because Ratnaparkhi provides a maximum entropy "framework, [which] is independent of the parsing task and can be used for many other problems, like language modeling for speech recognition." (see 1st paragraph of Section 3.2.1.).

As per claims 16 and 29, Chelba et al. in view of Ratnaparkhi teach the method according to claims 15 and 28, wherein the questions include a default, (wj-1), (wj-1, wj-2), (Li), (Li, Ni), (Li, Ni, wj-1), and (Oi, Mi), where w represents a word and j is an index representing word position (Ratnaparkhi's Fig. 9, Sections 3.2, 3.2.1, and 3.2.6., and equation (1) from Section 3.2.1., wherein *b* of equation (1) represents "any information that might be useful for predicting *a*," such as number of tokens for labels L or O.).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have used the feature of including a default, (wj-1), (wj-1, wj-2), (Li), (Li, Ni), (Li, Ni, wj-1), and (Oi, Mi) questions as taught by Ratnaparkhi for Chelba's method, as modified by Lee et al., because Ratnaparkhi provides a maximum entropy framework which is independent of the parsing task and can be used for many other problems, like language modeling for speech recognition, and which permits the use of arbitrarily diverse information in the context *b* when computing the probability of an action *a* of some procedure *X* (see 1st paragraphs of sections 3.2. and 3.2.1.).

11. Claims 34, 36-37, and 39-40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chelba et al. (US 2003/0216905) in view of Ratnaparkhi (Learning to Parse Natural Language with Maximum Entropy Models, 1999).

As per claim 34, Chelba et al. teach the system according to claim 31, but they do not specifically mention the semantic language model including unigram, bigram, and trigram features. However, Ratnaparkhi teaches the semantic language model including unigram, bigram, and trigram features (Fig. 9 and Table 3).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have used the feature of a semantic language model including unigram, bigram and trigram features as taught by Ratnaparkhi for Chelba's system because Ratnaparkhi provides a maximum entropy "framework, [which] is independent of the parsing task and can be used for many other problems, like language modeling for speech recognition." (see 1st paragraph of Section 3.2.1.).

As per claim 36, Chelba et al. teach the system according to claim 31, but they do not specifically mention wherein the semantic model is trained by including a unigram feature, a bigram feature, a trigram feature, a current active parent label (Li), a number of tokens (Ni) to the left since current parent label (Li) starts, a previous closed constituent label (Oi), a number of tokens (Mi) to the left after the previous closed constituent label finishes, and a number of questions to classify parser tree entries. However, Ratnaparkhi teaches a semantic model trained by including a unigram feature, a bigram feature, a trigram feature, a current active parent label (Li), a number of tokens (Ni) to the left since current parent label (Li) starts, a previous closed

constituent label (Oi), a number of tokens (Mi) to the left after the previous closed constituent label finishes, and a number of questions to classify parser tree entries (Fig. 9, Table 3, Sections 3.2, 3.2.1, and 3.2.6., and equation (1) from Section 3.2.1., wherein *b* of equation (1) represents "any information that might be useful for predicting *a*," such as number of tokens for labels L or O.).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have used the feature of a semantic model trained by including unigram, bigram, trigram, labels, and token features as taught by Ratnaparkhi for Chelba's system because Ratnaparkhi provides a maximum entropy "framework, [which] is independent of the parsing task and can be used for many other problems, like language modeling for speech recognition." (see 1st paragraph of Section 3.2.1.).

As per claim 37, Chelba et al. in view of Ratnaparkhi teach the system according to claim 36, wherein the questions include a default, (wj-1), (wj-1, wj-2), (Li), (Li, Ni), (Li, Ni, wj-1), and (Oi, Mi), where w represents a word and j is an index representing word position (Ratnaparkhi's Fig. 9, Sections 3.2, 3.2.1, and 3.2.6., and equation (1) from Section 3.2.1., wherein *b* of equation (1) represents "any information that might be useful for predicting *a*," such as number of tokens for labels L or O.).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have used the feature of including a default, (wj-1), (wj-1, wj-2), (Li), (Li, Ni), (Li, Ni, wj-1), and (Oi, Mi) questions as taught by Ratnaparkhi for Chelba's system because Ratnaparkhi provides a maximum entropy framework which is independent of the parsing task and can be used for many other problems, like

language modeling for speech recognition, and which permits the use of arbitrarily diverse information in the context *b* when computing the probability of an action *a* of some procedure *X* (see 1st paragraphs of sections 3.2. and 3.2.1.).

As per claim 39, Chelba et al. teach the system according to claim 38, but they do not specifically mention wherein the history parameters include a previous word (wj-1), a previous word of the previous word (wj-2), a parent constituent label (L), a number of tokens (N) to the left since L starts, a previous closed constituent label (O), a number of tokens (M) to the left after O finishes, and a grandparent label (G). However, Ratnaparkhi teaches history parameters, which include a previous word (wj-1), a previous word of the previous word (wj-2), a parent constituent label (L), a number of tokens (N) to the left since L starts, a previous closed constituent label (O), a number of tokens (M) to the left after O finishes, and a grandparent label (G) (Fig. 9, Sections 3.2 and 3.2.1, and equation (1) from Section 3.2.1., wherein *b* of equation (1) represents "any information that might be useful for predicting *a*," such as number of tokens for labels L or O.)

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have used the feature of history parameters as taught by Ratnaparkhi for Chelba's system because Ratnaparkhi provides a maximum entropy "framework, [which] is independent of the parsing task and can be used for many other problems, like language modeling for speech recognition." (see 1st paragraph of Section 3.2.1.). It would have also been obvious to one having ordinary skill in the art at the time the invention was made to have used the feature of history parameters as taught

by Ratnaparkhi in order to use arbitrarily diverse information in the context of *b* when computing the probability of an action *a* of some procedure *X* (see 1st paragraph of Section 3.2.).

As per claim 40, Chelba et al. in view of Ratnaparkhi teach the system according to claim 39, but they do not specifically mention wherein the history questions include a default, (wj-1), (wj-1, wj-2), (L, N), (O, M), and (L, G). However, Ratnaparkhi teaches history questions including a default, (wj-1), (wj-1, wj-2), (L, N), (O, M), and (L, G) (Fig. 9, Sections 3.2 and 3.2.1, and equation (1) from Section 3.2.1., wherein *b* of equation (1) represents "any information that might be useful for predicting *a*," such as number of tokens for labels L or O.).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have used the feature of history parameters as taught by Ratnaparkhi for Chelba's system because Ratnaparkhi provides a maximum entropy "framework, [which] is independent of the parsing task and can be used for many other problems, like language modeling for speech recognition." (see 1st paragraph of Section 3.2.1.). It would have also been obvious to one having ordinary skill in the art at the time the invention was made to have used the feature of history parameters as taught by Ratnaparkhi in order to use arbitrarily diverse information in the context of *b* when computing the probability of an action *a* of some procedure *X* (see 1st paragraph of Section 3.2.).

12. Claims 12 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chelba et al. (US 2003/0216905) in view of Lee et al. (US 2002/0087316), as

applied to claims 11 and 24 above, and further in view of San Segundo et al. (Confidence measures for spoken dialogue systems, 2001).

As per claims 12 and 25, Chelba et al. in view of Lee et al. teach the method according to claims 11 and 24, but they do not specifically mention the method further comprising the step of combining the semantic structured language models and speech recognition based features with the extracted probabilities using a classifier. However, San Segundo et al. teach the step of combining the semantic structured language models and speech recognition based features with the extracted probabilities using a classifier (Abstract and Sections 3, 3.1, 4, and 4.1).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have used the feature of combining the semantic structured language models and speech recognition based features with the extracted probabilities using a classifier as taught by San Segundo et al. for Chelba's method because San Segundo provides a neural network that combines features in each of the levels (word, utterance, and concept) in order to determine confidence measures which are used to improve the word recognition accuracy (Abstract).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Natalie Lennox whose telephone number is (571) 270-1649. The examiner can normally be reached on Monday to Friday 9:30 am - 7 pm (EST).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richemond Dorvil can be reached on (571)272-7602. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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NL 07/03/2007

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